How Maize Can Reduce Vitamin A Deficiency

Why is vitamin A important?
Vitamin A is essential for the human immune system and can help increase resistance to disease, protect against blindness, and improve chances for survival. Some 127 million preschool children are vitamin A deficient. Vitamin A deficiency is the leading cause of preventable blindness in children. Close to 20 million pregnant women in developing countries are also vitamin A deficient. About one-third of them are also clinically night blind.

How can staple foods like maize help reduce vitamin A deficiency?
Maize is one of the most important food crops in the world. It is the staple food of more than one billion people in sub-Saharan Africa and Latin America and is usually eaten daily at most meals. Most maize is high in carbohydrates but lacks essential micronutrients. Maize exhibits tremendous genetic diversity, and there are naturally occurring ‘varieties’ with higher amounts of beta-carotene. Beta-carotene and other carotenoids in maize are converted in the body to vitamin A, hence the name "provitamin A carotenoids" (PVACs). By breeding new varieties of maize that are rich in beta-carotene, millions of people who depend upon maize for sustenance will also benefit from the additional vitamin A their bodies produce from the beta-carotene.

How can you increase beta-carotene content of maize?
HarvestPlus and its partners are developing high-vitamin A maize through conventional breeding methods to provide vitamin A to millions of poor consumers through the diet, especially in Africa. These new varieties will first be released in Zambia where more than 50% of children 6–59 months of age suffer from vitamin A deficiency and where maize is an important part of the diet. The target release date for the new varieties is 2011–12. Other spillover countries that can benefit from these new varieties include Kenya, Malawi, Angola, Zimbabwe, Tanzania, Uganda, Ethiopia, Brazil, Guatemala, Mexico, and India.

What, exactly, is beta-carotene?
Carotenoids are a type of organic pigment found in plants. While there are hundreds of them, only a few of them can be converted by the body into vitamin A. Beta-carotene leads the pack and is most efficiently converted to vitamin A. It is mostly found in fruits and vegetables, such as red palm fruit, papaya, and carrots, which display its telltale yellow to orange color. Maize with high amounts of beta-carotene is similarly yellow to orange in color. However, much of the beta-carotene produced in maize is converted into other types of carotenoids, such as beta-cryptoxanthin and zeaxanthin, which are far less potent when it comes to making vitamin A. Recent research has identified rare genetic variations in maize that actually slow down this conversion process and can be used to breed new maize varieties with more beta-carotene.

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